

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended) A field emission device comprising:

a substrate;

a cathode formed on the substrate;

a gate insulating layer formed above the substrate and having a well exposing a portion of the cathode;

an electron emitter formed on the exposed portion of the cathode; and

a gate electrode formed on the gate insulating layer and having a gate hole corresponding to the well,

wherein the gate electrode further includes a cylindrical electrode part that forms a focusing electric field from the gate hole toward a proceeding path of an electron beam emitted from the electron emitter and wherein said focusing electric field is axisymmetric with respect to a central axis of the electron beam.

2. (Previously Presented) The field emission device of claim 1, wherein the cylindrical electrode part is a Bellmouse shaped electrode part that broadens in the direction of propagation of the electron beam.

3. (Previously Presented) The field emission device of claim 1, wherein the electron emitter includes carbon nanotubes.

4. (Previously Presented) The field emission device of claim 2, wherein the electron emitter includes carbon nanotubes.

5. (Previously Presented) The field emission device of claim 1, wherein the field emission device has a double gate electrode in which an additional gate electrode is formed beneath a gate electrode on which the cylindrical electrode part is to be formed.

6. (Previously Presented) The field emission device of claim 2, wherein the field emission device has a double gate electrode in which an additional gate electrode is formed beneath a gate electrode on which the cylindrical electrode part is to be formed.

7-15. (Canceled)

16. (Previously Presented) The field emission device of claim 1, wherein the electron emitter includes micro tips.

17. (Previously Presented) The field emission device of claim 1, wherein the electron emitter includes micro tips.

18. (Currently Amended) A field emission device comprising:
a substrate;

a cathode formed on the substrate;

a gate insulating layer formed above the substrate having a well exposing a portion of the cathode;

an electron emitter formed on the exposed portion of the cathode; and

a gate electrode formed on the gate insulating layer and having a gate hole corresponding to the well,

wherein the gate electrode further includes a cylindrical electrode part having one end closer to the substrate that has a smaller radius and another end further from the substrate having a larger radius, and a surface between the one and the other end such that upon application of an electric field, a converging electric lens is formed at a proceeding path of an electron beam emitted from the electron emitter and wherein said electric lens is axisymmetric with respect to a central axis of the electron beam.

19. (Previously Presented) The field emission device of claim 18, wherein the cylindrical electrode part is a Bellmouse shaped electrode part that broadens in the direction of propagation of the electron beam.

20. (Previously Presented) The field emission device of claim 18, wherein the electron emitter includes carbon nanotubes.

21. (Previously Presented) The field emission device of claim 19, wherein the electron emitter includes carbon nanotubes.

22. (Previously Presented) The field emission device of claim 18, wherein the electron emitter includes micro tips.

23. (Previously Presented) The field emission device of claim 19, wherein the electron emitter includes micro tips.

24. (Previously Presented) The field emission device of claim 18, wherein the field emission device has a double gate electrode in which an additional gate electrode is formed beneath a gate electrode on which the cylindrical electrode part is to be formed.

25. (Previously Presented) The field emission device of claim 19, wherein the field emission device has a double gate electrode in which an additional gate electrode is formed beneath a gate electrode on which the cylindrical electrode part is to be formed.